

**WHAT IS CLAIMED IS:**

1           1.       A method for interconnecting wired and wireless phone services of a system for  
2       interconnecting wired and wireless phone services, the method comprising the steps of:

3                registering at least one of a plurality of wired terminals and public and private mobile  
4       communication terminals as extension subscribers and endowing the extension subscribers with each  
5       of wired phone numbers; and

6                when an arbitrary wired phone number is called, making a call to the wired terminal  
7       corresponding to the wired phone number, and when there is the public and private mobile  
8       communication terminal to be simultaneously called with the wired phone number interconnectively,  
9       making a call to the corresponding public and private mobile communication terminal through a  
10      mobile communication network.

1           2.       The method according to claim 1, wherein the step of making a call to the public and  
2       private mobile communication terminal comprising the steps of:

3                when an arbitrary wired phone number is called, searching for a database and determining  
4       whether there is the public and private mobile communication terminal to be simultaneously called  
5       with the wired phone number interconnectively; and

6                when there is the public and private mobile communication terminal to be simultaneously  
7       called with the wired phone number interconnectively as a result of the determination, transferring  
8       a ring signal to the corresponding wired phone terminal and to the public and private mobile

9 communication terminal, simultaneously.

1 3. The method according to claim 2, wherein the step of transferring the ring signal to  
2 the public and private mobile communication terminal comprising the steps of:

3 transferring the ring signal for making a call to the public and private mobile communication  
4 terminal through a private base station apparatus which provides the public and private mobile  
5 communication terminal with a wireless environment; and

6 when there is no response from the public and private mobile communication terminal for  
7 a predetermined time, transferring the ring signal for making a call to the public and private mobile  
8 communication terminal through the public mobile communication network.

1 4. The method according to claim 2, wherein said database includes a wired phone  
2 number with which each wired terminal is endowed, a wired phone number with which each of the  
3 public and private mobile communication terminals is endowed, and a phone number with which  
4 each of the public and private mobile communication terminal is endowed through the public mobile  
5 communication network.

1 5. The method according to claim 2, wherein said database includes first identification  
2 information indicating whether an arbitrary wired phone number is a number connected to a terminal  
3 or not, second identification information indicating whether the wired phone number uses a  
4 simultaneous terminating service or not, and a wired phone number of said public and private mobile

5 communication terminal which is called by the simultaneous terminating function.

1 6. The method according to claim 1, further comprising steps of:

2 when an arbitrary phone number is called, determining whether the corresponding wired  
3 phone number is a wired subscriber terminal or not; and

4 when the corresponding wired phone number is not a wired subscriber terminal as a result  
5 of the determination, making a call to the public and private mobile communication terminal  
6 corresponding to the wired phone number through the mobile communication network.

1 7. The method according to claim 1, wherein, in the case that an outgoing request is  
2 made from the public and private mobile communication terminal, the method comprising steps of:

3 receiving an outgoing phone number and a mobile identifier number of the public and private  
4 mobile communication terminal endowed from the public mobile communication network, from the  
5 public and private mobile communication terminal;

6 determining whether a private mobile communication service is used or not from the  
7 outgoing phone number; and

8 when the private mobile communication service is used as a result of the determination,  
9 transmitting the wired phone number with which the corresponding public and private mobile  
10 communication terminal is endowed using the caller identification.

1 8. The method according to claim 7, wherein, in the case that an outgoing request is

2 made from the public and private mobile communication terminal, the method further comprising  
3 step of:

4 when the public mobile communication service is used as a result of the determination,  
5 transmitting the mobile identifier number of the public and private mobile communication terminal  
6 which is received from said public and private mobile communication terminal using the caller  
7 identification.

1 9. A method for interconnecting wired and wireless phone services of a system for  
2 interconnecting wired and wireless phone services, the method comprising:

3 making a call to a phone number of another party while using a wireless terminal;

4 transferring the call generated by the wireless terminal to a wired and wireless  
5 interconnecting unit;

6 changing by the wired and wireless interconnecting unit, a caller identification of the call to  
7 a virtual wired number with which a wireless terminal is endowed; and

8 determining whether the phone number of the call is an external outgoing number, the  
9 external outgoing number being outside of a mobile zone of the wireless terminal.

1 10. The method of claim 9, further comprising of storing the call in a message and  
2 transferring to the wired and wireless interconnecting unit when the phone number is an external  
3 outgoing number.

1           11. The method of claim 10, further comprising of making a call to an external subscriber  
2 of the corresponding phone number by said wired and wireless interconnecting unit.

1           12. The method of claim 11, further comprising of making a call to an internal subscriber  
2 within the mobile zone when the phone number is not an external outgoing number.

1           13. The method of claim 12, with said transferring of the call generated by the wireless  
2 terminal to the wired and wireless interconnecting unit further comprised of transferring the call to  
3 a mobile gateway of said wired and wireless interconnecting unit through a private base station  
4 transceiver subsystem and a private base station controller of said wired and wireless interconnecting  
5 unit, said private base station transceiver subsystem constructing a wireless communication path with  
6 an arbitrary mobile communication terminal in a service area of said private base station transceiver  
7 subsystem and manages wireless resources for the mobile communication.

1           14. The method of claim 13, with said changing by the wired and wireless interconnecting  
2 unit being changing by the private base station controller of the wired and wireless interconnecting  
3 unit.

1           15. The method of claim 14, with said determining whether the phone number of the call is  
2 an external outgoing number being performed by said mobile gateway.

1           16. The method of claim 15, with said transferring to the wired and wireless interconnecting  
2           unit when the phone number is an external outgoing number further comprised of transferring to a  
3           wired exchange of said wired and wireless interconnecting unit when the phone number is an  
4           external outgoing number.

1           17. The method of claim 9, with said transferring of the call generated by the wireless  
2           terminal to the wired and wireless interconnecting unit further comprised of transferring the call to  
3           a mobile gateway of said wired and wireless interconnecting unit through a private base station  
4           transceiver subsystem and a private base station controller of said wired and wireless interconnecting  
5           unit, said private base station transceiver subsystem constructing a wireless communication path with  
6           an arbitrary mobile communication terminal in a service area of said private base station transceiver  
7           subsystem and manages wireless resources for the mobile communication.

1           18. The method of claim 17, with said changing by the wired and wireless interconnecting  
2           unit being changing by the private base station controller of the wired and wireless interconnecting  
3           unit.

1           19. The method of claim 18, with said determining whether the phone number of the call is  
2           an external outgoing number being performed by said mobile gateway.

1           20. The method of claim 9, with said transferring of the call generated by the wireless

2 terminal to the wired and wireless interconnecting unit further comprised of transferring the call to  
3 a group exchange of said wired and wireless interconnecting unit through a private base station  
4 transceiver subsystem and a private base station controller of said wired and wireless interconnecting  
5 unit, said private base station transceiver subsystem constructing a wireless communication path with  
6 an arbitrary mobile communication terminal in a service area of said private base station transceiver  
7 subsystem and manages wireless resources for the mobile communication, said group exchange  
8 endowing each extension subscriber with a wired phone number.

1 21. The method of claim 20, with said changing by the wired and wireless interconnecting  
2 unit being changing by the private base station controller of the wired and wireless interconnecting  
3 unit.

1 22. The method of claim 21, with said determining whether the phone number of the call is  
2 an external outgoing number being performed by said group exchange.

1 23. A method for interconnecting wired and wireless phone services of a system for  
2 interconnecting wired and wireless phone services, the method comprising:

3 when an arbitrary external subscriber terminal makes a call to an arbitrary wired phone  
4 number through a public network, calling a first part of a wired and wireless interconnecting unit  
5 with a corresponding wired phone number through the public network and determining whether the  
6 called phone number is a wired subscriber number;

7           when the called phone number is the wired subscriber number, transferring the called phone  
8           number to a second part of the wired and wireless interconnecting unit through the wired subscriber  
9           circuit; and

10          when the called phone number is not the wired subscriber number, distributing the virtual  
11          subscriber circuit to a wireless terminal selected and transferred to the second part of the wired and  
12          wireless interconnecting unit.

1           24. The method of claim 23, further comprising of:

2           determining by a second part of the wired and wireless interconnecting unit, whether the  
3           corresponding phone number in a database of the second part is a multiple terminating number.

1           25. The method of claim 24, further comprising of when the corresponding phone number  
2           is not the multiple terminating number, distributing the call to the wired subscriber.

1           26. The method of claim 25, further comprising of when the corresponding phone number  
2           is the multiple terminating number, distributing the call to the wired subscriber at first and then the  
3           second part of the wired and wireless interconnecting unit requests a virtual number and the virtual  
4           number for the corresponding wired phone number is provided and the call is distributed to the  
5           corresponding wireless terminal.

1           27. The method of claim 26, further comprising of:



2           when it is not the wired subscriber number as a result of the determination, selecting a virtual  
3           subscriber circuit distributed to the wireless terminal and transferring to the first part of the wired  
4           and wireless connecting apparatus; and

5           distributing by the first part, the call to the corresponding wireless terminal after selecting  
6           the virtual subscriber circuit distributed to the wireless terminal and transferring the circuit to the  
7           first part and accordingly, the corresponding wireless terminal responds to the distribution.

1           28. The method of claim 27, further comprising of:

2           when an arbitrary subscriber terminal makes a call to an arbitrary wired phone number,  
3           receiving by the second part of the wired and wireless interconnecting unit, the corresponding wired  
4           phone number and determines whether the called phone number is an incoming call number for an  
5           extension subscriber in the second part;

6           when the called phone number is not the extension incoming call, performing a Tandem call  
7           and transferring the call to the first part; and

8           when the called phone number is an extension incoming call, determining by the second part  
9           whether the corresponding phone number is a wired phone number in said step of determining  
10          whether the called phone number is the wired subscriber number.

1           29. A method for interconnecting wired and wireless phone services of a system for  
2           interconnecting wired and wireless phone services, the method comprising:

3           when an arbitrary external subscriber terminal makes a call to an arbitrary wired phone

4 number through a public network, calling by a first part of a wired and wireless interconnecting unit,  
5 the corresponding wired phone number through the public network and determining whether the  
6 called phone number is the wired subscriber number;

7 when the called phone number is the wired subscriber number, transferring the called phone  
8 number to a second part of said wired and wireless interconnecting unit through a wired subscriber  
9 circuit;

10 determining by the second part, whether the corresponding phone number in a database is  
11 a multiple terminating number;

12 when the corresponding phone number is the multiple terminating number, distributing the  
13 call to the wired subscriber at first and then the second part requests a virtual number, and the virtual  
14 number for the corresponding wired phone number is provided and the call is distributed to the  
15 corresponding wireless terminal;

16 when the wired terminal and the wireless terminal responds in a mobile zone, processing the  
17 call according to the response;

18 determining whether there exists a subscriber in the mobile zone when there is no response;

19 when there does not exist the subscriber in the mobile zone as the response of the wired  
20 terminal or wireless terminal does not exist in the mobile zone, making by the second part of the  
21 wired and wireless interconnecting unit, a call to a wireless terminal in a public mobile  
22 communication network; and

23 when the subscriber exists in the mobile zone and there is no response, transmitting a voice  
24 information message to the wireless terminal in the mobile zone.

1           30. The method of claim 29, further comprising of when the corresponding phone number  
2 is not the multiple terminating number, distributing the call to the wired subscriber.

1           31. The method of claim 30, when the called phone number is not the wired subscriber  
2 number as a result of the determination, selecting the virtual subscriber circuit distributed to the  
3 wireless terminal and transferring to the second part of the wired and wireless interconnecting unit.

1           32. The method of claim 29, further comprising of when the called phone number is not the  
2 extension incoming call number, transferring the called phone number to the first part of the wired  
3 and wireless interconnecting unit and the called phone number is a Tandem call number.

1           33. The method of claim 29, further comprising of when an arbitrary subscriber terminal  
2 makes a call to an arbitrary wired phone number through the public network, the second part receives  
3 the corresponding wired phone number through the public network and determines whether the  
4 called phone number is the incoming call number for the extension subscriber in the second part in  
5 the step of determining whether the called phone number is the wired subscriber number.

1           34. A computer-readable medium having computer-executable instructions for performing  
2 a method, comprising:

3           endowing each of a plurality of extension subscribers with wired phone numbers where at

4 least one of a plurality of wired terminals and mobile communication terminals are extension  
5 subscribers;

6 making a call to said wired terminal corresponding to the wired phone number when a wired  
7 phone number is called; and

8 making a call to the corresponding mobile communication terminal through a mobile  
9 communication network when there is said mobile communication terminal to be simultaneously  
10 called with the wired phone number interconnectively.

1 35. The computer-readable medium having computer-executable instructions for  
2 performing a method of claim 34, wherein the making of the call to the mobile communication  
3 terminal comprising of:

4 when a wired phone number is called, determining whether there is the mobile  
5 communication terminal to be simultaneously called with the wired phone number interconnectively.

1 36. The computer-readable medium having computer-executable instructions for  
2 performing a method of claim 35, wherein the making of the call to the mobile communication  
3 terminal further comprising of:

4 when there is the mobile communication terminal to be simultaneously called with the wired  
5 phone number interconnectively as a result of the determination, transferring a ring signal to the  
6 corresponding wired phone terminal and to the mobile communication terminal, simultaneously.

1           37.    A computer-readable medium having stored thereon a data structure comprising:  
2           a first field containing data representing, when an arbitrary external subscriber terminal  
3           makes a call to an arbitrary wired phone number a public network, calling a first part of a wired and  
4           wireless interconnecting unit with a corresponding wired phone number through the public network  
5           and determining whether the called phone number is a wired subscriber number;  
6           a second field containing data representing, when the called phone number is the wired  
7           subscriber number, the called phone number is transferred to a second part of the wired and wireless  
8           interconnecting unit through the wired subscriber circuit; and  
9           a third field containing data representing, when the called phone number is not the wired  
10          subscriber number, distributing the virtual subscriber circuit to a wireless terminal selected and  
11          transferred to the second part of the wired and wireless interconnecting unit.